

14 connected to the first collar, so that upon movement of the
15 first collar in a direction away from the second ends of the
16 spring bows the first ends move with the first collar and the
17 spring bows move inwardly toward the tubular body.

1 ~~22~~²¹. The centralizer apparatus of claim ~~21~~¹ further comprising
2 a second collar movably emplaced around the tubular
3 body and movable longitudinally thereon,
4 the second ends of the spring bows connected to the
5 second collar, so that upon movement of the second collar in
6 a direction away from the first ends of the spring bows the
7 second ends of the spring bows move with the second collar and
8 the spring bows move inwardly toward the tubular body,
9 a second groove in the exterior surface of the
10 tubular body, the second groove defined by a top side wall and
11 a bottom side wall, and a middle wall therebetween,
12 the second collar movably disposed in the second
13 groove, and
14 the second groove top side wall and bottom side wall
15 limiting second collar movement.

1 ~~23~~²². The centralizer apparatus of claim ~~22~~² further comprising
2 a spring bow recess in the exterior surface of the
3 tubular body beneath each spring bow for receiving a portion
4 of each spring bow.

1 ~~24~~²³. The centralizer apparatus of claim ~~23~~³ wherein an exterior
2 surface of the tubular body has a top level and the centralizer
3 apparatus further comprising
4 the first collar at or below the top level of the
5 exterior surface of the tubular body, and
6 a major portion of the spring bows receivable in the
7 spring recesses and disposable therein at or below the top
8 level of the exterior surface of the tubular body.

1 ~~25~~²⁴. The centralizer apparatus of claim ~~24~~⁴ wherein the
2 exterior surface of the tubular body has a top level and the
3 centralizer apparatus further comprising

4 the second collar at or below the top level of the
5 exterior surface of the tubular body, and

6 a major portion of the spring bows receivable in the
7 spring recesses and disposable therein at or below the top
8 level of the exterior surface of the tubular body.

1 26. The centralizer apparatus of claim ~~21~~ further comprising
2 the tubular body is hollow with a bore extending
3 longitudinally therethrough.

1 27. The centralizer apparatus of claim ~~21~~ wherein the second
2 ends of the spring bows are secured to a second collar which is
3 immovably secured to the tubular body.

1 28. The centralizer apparatus of claim ~~21~~ further comprising
2 the first collar releasably emplaced around the
3 tubular body.

1 29. The centralizer apparatus of claim ~~22~~ further comprising
2 the second collar releasably emplaced around the
3 tubular body.

1 30. The centralizer apparatus of claim ~~21~~ further comprising
2 the second ends of the spring bows immovably secured
3 to the tubular body.

1 31. A centralizer apparatus comprising
2 a hollow tubular body with an exterior surface and
3 a longitudinal bore therethrough,

4 a first collar movably emplaced around the tubular
5 body and movable longitudinally thereon,

6 a plurality of spring bows, each spring bow having
7 a first end spaced apart from a second end, each spring bow
8 biased outwardly from the tubular body,

9 a first groove in the exterior surface of the
10 tubular body, the groove defined by a top side wall and a
11 bottom side wall, and a middle wall therebetween,

12 the first collar movably disposed in the groove,
13 the first groove top side wall and bottom side wall
14 limiting first collar movement,

15 the first ends of the spring bows connected to the

16 first collar, so that upon movement of the first collar in a
17 direction away from the second ends of the spring bows the
18 spring bows move inwardly toward the tubular body,

19 a second collar movably emplaced around the tubular
20 body and movable longitudinally thereon,

21 the second ends of the spring bows connected to the
22 second collar, so that upon movement of the second collar away
23 from the first collar, the spring bows move inwardly toward
24 the tubular body,

25 a second groove in the exterior surface of the
26 tubular body, the second groove defined by a top side wall and
27 a bottom side wall, and a middle wall therebetween,

28 the second collar movably disposed in the groove,
29 and

30 the second groove top side wall and bottom side wall
31 limiting second collar movement.

1 ¹³32. A centralizer apparatus comprising

2 a tubular body with an exterior surface, and

3 a plurality of spring bows, each spring bow in an
4 initial position and having a first end spaced apart from a
5 second end, each spring bow biased outwardly from the tubular
6 body, the first ends secured to the tubular body, the second
7 ends movable with respect to the tubular body and, the second
8 ends spaced apart from and not interconnected with each other.

1 ¹⁴33. The centralizer apparatus of claim ³² further comprising

2 the spring bows movable inwardly toward the tubular
3 body by contact with an upper edge or an inner surface of a
4 hollow tubular member, and

5 upon movement of the centralizer apparatus through
6 the hollow tubular member and upon exiting therefrom and
7 cessation of contact with the hollow tubular member and
8 release of the spring bows therefrom, the spring bows expand
9 outwardly and move outwardly away from the tubular body back
10 to the initial position.

1 ¹⁵34. The centralizer apparatus of claim ¹⁴33 further comprising